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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Louis A. Lippincott

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EXAMINER

SINGH, DALIP K

ART UNIT

PAPER NUMBER

2628

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/753,259	LIPPINCOTT, LOUIS A.	
	Examiner	Art Unit	
	Dalip K. Singh	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-15,17-19,21 and 23-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-15,17-19,21 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to applicant's amendment dated January 13, 2006 in response to PTO Office Action dated October 7, 2005. The amendments to claim(s) 1, 9, 15 and 21 have been noted and entered in the record, and applicant's remarks have been carefully considered resulting in the action as set forth herein below.

2. Applicant's arguments with respect to claims 1, 9, 15 and 21 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Reference 4,816,815 to Yoshiba in view of U.S. Patent No. 6,396,473 to Callahan et al., and further in view of US 5,754,191 to Mills et al.

a. Regarding claim 1, Yoshiba **discloses** a dual frame buffer system (Figure 1), comprising: a first frame buffer (first display memory (VRAM) 16); a second frame buffer (second VRAM 24); and a controller (CRTC 22) **identifying** (...the control is constructed to control the first and second memories...and a command from the host machine specifying that part of display data stored in the first memory which has been updated...display data in the updated part is transferred from the first memory to the display unit to be displayed thereon and to the second memory to be stored therein...col. 2, lines 40-48) and copying updated data from the first frame buffer (first display

memory (VRAM) 16) to the second frame buffer (second VRAM 24) when updated data is needed to refresh the display monitor (col. 3, lines 47-68; col. 4, lines 1-8). Yoshiba is **silent about** a first frame buffer being divided into a plurality of regions. Callahan et al. **discloses** an offscreen buffer and an onscreen buffer wherein these buffers are tiled for efficient memory operations (...in one implementation,...onscreen buffered graphics are tiled...in another implementation, off-screen buffered graphics are tiled also....col. 2, lines 40-67; col. 3, lines 1-15) and employs two techniques for dynamic updating/copying of data from offscreen/onscreen buffers (tiles). Firstly, in case of insufficient memory space for indirect and invisible processing, the offscreen graphic buffer is processed directly to the existing onscreen tiles within the onscreen buffer (...two techniques may be used to update tiles within the onscreen buffer...new tiles are created and swapped in...the tiles created so far are swapped into the onscreen buffer...until the update is complete...col. 10, lines 9-46). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device as taught by Yoshiba with the feature “tiled regions of frame buffers which are copied to the display as they are updated” as taught by Callahan et al. **because** it results in significant memory savings (col. 12, lines 7-20). However, Yoshiba-Callahan combination **does not disclose** wherein at least one identified region includes both an updated portion of data and an unupdated portion of data. The instant application’s specification on sheet 7 lines 14-20 describes where in Fig. 2(b) many pixels copied in the frame are not part of the required tiles but are associated with the touched tile and thus need to be copied (...Referrring to FIG. 2(b), there are many pixels copied in this frame that were not parts of the “t”. For example, the pixels associated with the letter “s” are copied since they are associated with the same touched tile 44...specification sheet 7, lines 14-20). In other words, associated tile data that was not updated is also copied. Mills et al. **discloses**

enabling pixel data to be written to the frame buffer when the pixel data traverses a tile boundary in the frame buffer (...the present invention enables the pixel data to be written to the frame buffer in one or more packets when the pixel data traverses a tile boundary in the frame buffer without corrupting the frame buffer due to incorrect byte enable data...col. 3, lines 20-25); and includes enabling pixel data representing single or multi-line operations that cross tile boundaries (...The present invention solves the problem of prior art system's inability to retain byte enable data when pixel data being written to the frame buffer traverses a tile boundary requiring the data to be written in more than one packet. The present invention retains the byte enable data by utilizing the shifting logic to shift the byte enable data in the storage units until the entire information representing the pixel data being written is completed...col. 3, lines 45-53;...advantages of the present invention include enabling pixel data representing single or multi-line operations that cross tile boundaries to be written to one or more locations in a tile-based frame buffer without losing any byte enable data associated with the pixel data...col. 4, lines 1-8). Mills et al. thus is able to provide for associated tiles that were next to the touched tiles in question, and thus provide for updated and unupdated tiles. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device as taught by Yoshiba-Callahan combination with the feature "associated tiles that have not been updated but are adjacent to the touched tile made available" as taught by Mills et al. **because** it provides for multi-line pixel data to be processed to the frame buffer without incurring extra clock cycles.

b. Regarding claim 2, Yoshiba et al. **discloses** wherein the controller (CRTC 22) coordinates refresh of the display monitor using data stored in the second frame buffer (second VRAM 24) and data updated within the first frame buffer (first display memory (VRAM) 16) (col. 4, lines 3-5).

- c. Regarding claim 3, Yoshiba **discloses** the dual frame buffer system, further comprising: a first address generator (display address counter 155, Fig. 5) corresponding to the first frame buffer (display data buffer 164, Fig. 5); a second address generator (display address counter 130, Fig. 5) corresponding to the second frame buffer (display data buffer 166); and a timing generator (sync signal generator for crt 158) for coordinating the timing between the first and second address generators (display address counter 155, 130 Fig. 5) for refreshing the display monitor.
- d. Regarding claim 15, it is similar in scope to claim 1 above and is rejected under the same rationale.
- e. Regarding claim 21, it is similar in scope to claim 1 above and is rejected under the same rationale.
5. Claims 4-6, 17-19, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,816,815 to Yoshiba in view of U.S. Patent No. 6,396,473 to Callahan et al , and further in view of US 5,754,191 to Mills et al. as applied to claim 1 above, and further in view of U.S. Patent No. 5,757,364 to Ozawa et al.
- a. Regarding claim 4, Yoshiba-Callahan-Mills combination **does not disclose** a detector for detecting when an update is made to the data in the first frame buffer; and a decoder for decoding the location of the updated data. Ozawa et al. **discloses** a detector (window type table 132, comparator 118) for detecting when an update is made to the data in the first frame buffer; and a decoder (selector 121) for decoding the location of the updated data (col. 4, lines 36-48; col. 5, lines 1-67; col. 6, lines 1-41). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify Yoshiba-Callahan-Mills with the feature “detector and decoding and transmitting only the updated data” as taught by Ozawa et al. **because** it provides for

efficiently rendering frames by transmitting only the updated data and provides for efficient real time displaying dynamic images (col. 1, lines 40-67).

b. Regarding claim 5, Yoshiba as modified by Callahan et al. **discloses** wherein the first frame buffer comprises a plurality of regions (...in one implementation,...onscreen buffered graphics are tiled...in another implementation, off-screen buffered graphics are tiled also....col. 2, lines 40-67; col. 3, lines 1-15) ...two techniques may be used to update tiles within the onscreen buffer...new tiles are created and swapped in...the tiles created so far are swapped into the onscreen buffer...until the update is complete...col. 10, lines 9-46). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device as taught by Yoshiba with the feature “tiled regions of frame buffers which are copied to the display as they are updated” as taught by Callahan et al. **because** it results in significant memory savings (col. 12, lines 7-20) (col. 3, lines 56-65).

c. Regarding claim 6, Yoshiba **discloses** wherein the controller transmits the identified region from the first frame buffer to the second frame buffer and the display monitor when the display is refreshed (...concerning the updated part of the display data, it is read out of the store region 314 of the VRAM 16 and transferred to the CRT 10 to be displayed and, at the same time, transferred to the VRAM 24 to be stored in a store region 320 associated therewith. This displays the new image on the CRT 10 and updates the content of the VRAM 24 at the same time...col. 8, lines 14-25).

d. Regarding claim 17, it is similar in scope to claim 4 above and is rejected under the same rationale.

e. Regarding claim 18, it is similar in scope to claim 5 above and is rejected under the same rationale.

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- f. Regarding claims 19, it is similar in scope to claim 6 above and is rejected under the same rationale.
 - f. Regarding claim 23, it is similar in scope to claim 4 above and is rejected under the same rationale.
 - g. Regarding claim 24, it is similar in scope to claim 5 above and is rejected under the same rationale.
 - g. Regarding claim 25, it is similar in scope to claim 6 above and is rejected under the same rationale.
6. Claims 7, 9, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,816,815 to Yoshiba in view of U.S. Patent No. 6,396,473 to Callahan et al., and further in view of US 5,754,191 to Mills et al. as applied to claim 1 above, and further in view of U.S. Patent No. 5,790,138 to Hsu.
- a. Regarding claims 7 and 9, Yoshiba-Callahan combination **does not disclose** wherein at least one identified region includes both an updated portion of data and an unupdated portion of data. The instant application's specification on sheet 7 lines 14-20 describes where in Fig. 2(b) many pixels copied in the frame are not part of the required tiles but are associated with the touched tile and thus need to be copied (...Referring to FIG. 2(b), there are many pixels copied in this frame that were not parts of the "t". For example, the pixels associated with the letter "s" are copied since they are associated with the same touched tile 44...specification sheet 7, lines 14-20). In other words, associated tile data that was not updated is also copied. Mills et al. **discloses** enabling pixel data to be written to the frame buffer when the pixel data traverses a tile boundary in the frame buffer (...the present invention enables the pixel data to be written to the frame buffer in one or more packets when the pixel data traverses a tile boundary in the frame buffer without corrupting the frame buffer due to incorrect byte enable data...col. 3, lines 20-

25); and includes enabling pixel data representing single or multi-line operations that cross tile boundaries (...The present invention solves the problem of prior art system's inability to retain byte enable data when pixel data being written to the frame buffer traverses a tile boundary requiring the data to be written in more than one packet. The present invention retains the byte enable data by utilizing the shifting logic to shift the byte enable data in the storage units until the entire information representing the pixel data being written is completed...col. 3, lines 45-53;...advantages of the present invention include enabling pixel data representing single or multi-line operations that cross tile boundaries to be written to one or more locations in a tile-based frame buffer without losing any byte enable data associated with the pixel data...col. 4, lines 1-8). Mills et al. thus is able to provide for associated tiles that were next to the touched tiles in question, and thus provide for updated and unupdated tiles. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device as taught by Yoshiba-Callahan combination with the feature "associated tiles that have not been updated but are adjacent to the touched tile made available" as taught by Mills et al. **because** it provides for multi-line pixel data to be processed to the frame buffer without incurring extra clock cycles. However, Yoshiba-Callahan-Mills combination **does not disclose** wherein the first frame buffer is part of a unified memory architecture. Hsu **discloses** a computer unified memory architecture system wherein the first frame buffer (frame buffer memory 304b) is part of a unified memory architecture (col. 3, lines 65-67; col. 4, lines 1-9). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify Yoshiba-Callahan-Mills combination with the feature "frame buffer as part of a unified memory architecture" as taught by Hsu **because** it provides for a lower system cost (col. 1, lines 62-65).

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- b. Regarding claim 10, it is similar in scope to claim 2 above and is rejected under the same rationale.
- c. Regarding claims 11, it is similar in scope to claim 3 above and is rejected under the same rationale.
- d. Regarding claim 12, it is similar in scope to claim 4 above and is rejected under the same rationale.
- e. Regarding claim 13, it is similar in scope to claim 5 above and is rejected under the same rationale.
- f. Regarding claims 14, it is similar in scope to claim 6 above and is rejected under the same rationale.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Dalip K. Singh** whose telephone number is **(571) 272-7792**. The examiner can normally be reached on Mon-Friday (10:00AM-6:30PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Ulka Chauhan**, can be reached at **(571) 272-7782**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Please note that the new Central Official FAX number for application specific communications with the USPTO is **571-273-8300** (effective July 15, 2005).

Dalip K. Singh
Examiner, Art Unit 2628

dks
October 18, 2006


ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER